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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/680,647	10/07/2003	Rene Helbing	10020590-1	5104

7590 08/09/2005

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EXAMINER	
JUBA JR, JOHN	

ART UNIT	PAPER NUMBER
2872	

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/680,647	HELBING ET AL.	
	Examiner	Art Unit	
	John Juba, Jr.	2872	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 May 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 6-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,6-11 and 13-20* is/are rejected.

7)☒ Claim(s) *12* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

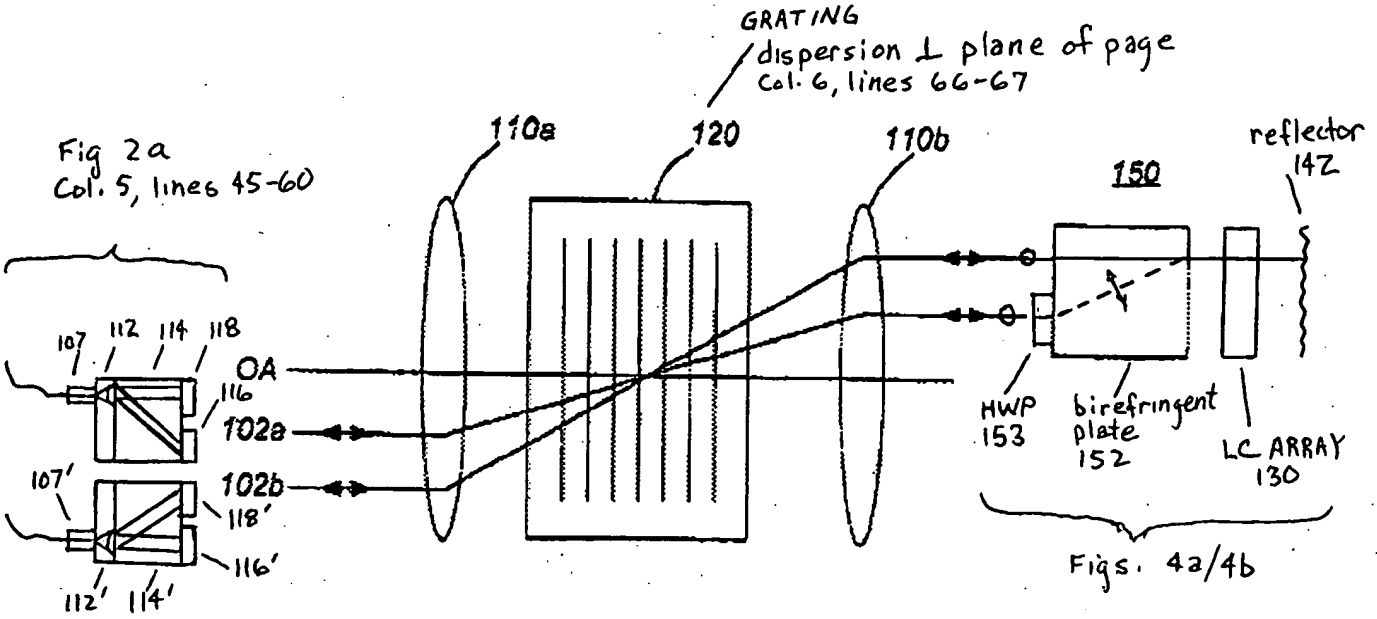
Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3, 6 – 9, 11, and 13 – 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Bouevitch, et al (U.S. Patent number 6,498,872). Referring *initially* to Figure 1, and noting that Bouevitch, et al disclose operation as a configurable optical add-drop multiplexer (COADM) wherein dispersion by grating (120) is into the plane of the page (Col. 6, lines 64 - 67), it should be clear that input (102a) receives a plurality of wavelength division multiplexed (WDM) optical signals. The input port (102a) and output port (102b) are each disclosed as being provided with polarization diversity optics such as shown in Figure 2a (Col. 5, lines 38-60). Bouevitch, et al anticipates an embodiment in which "modifying means" (150) are replaced with the arrangement shown in Figures 4a and 4b, wherein the examiner believes birefringent crystal (152) fairly constitutes a walk-off type "polarizing beamsplitter" within the ordinary meaning of the expression. Applicants have not set forth any special definition in the specification for the expression "polarizing beamsplitter", and as such, it is ascribed only its ordinary meaning. Since Bouevitch, et al do not *illustrate* the embodiment in its entirety, the

examiner has modified Figure 1 of the reference in accordance with the disclosure to arrive at the figure below.



Thus, Bouevitch, et al disclose an optical device comprising:

an optics system comprising an input (107)(112)(114)(116)(118) to receive (WDM) optical signals (102a) in an incoming direction and an output (107')(112')(114')(116')(118') to selectively transmit a selected optical signal (102b) of said optical signals in an outgoing direction, said optics system being configured to selectively rotate one of the polarization components of each of said optical signals in said incoming direction to a first polarization state (*e.g.*, horizontal; Col. 5, lines 45 – 60) by means of half-wave plate (116);

an optical unit optically coupled to said optics system, said optical unit (150) being configured to laterally displace and rotate said polarization components of said selected optical signal such that said polarization components of said selected optical signal in said outgoing direction are in said

first polarization state, said optical unit comprising a polarization beam splitter (152) and a wave plate (153) positioned such that said polarization components of said selected optical signal in said outgoing direction are selectively transmitted through said wave plate; and

a diffraction grating (120) positioned between said optics system and said optical unit to diffract said polarization components of said selected optical signal in said incoming and outgoing directions, said polarization components of said selected optical signal being in said first polarization state in both said incoming and outgoing directions.

Although Bouevitch, et al do not *expressly* state that the polarization components of said selected optical signal are in the same state in the incoming and outgoing directions, one of ordinary skill would understand that, since there are no intervening polarization changing components, the signals *must be* so polarized if the apparatus disclosed is to operate to coupled light between the input and output ports in the manner disclosed. The reference is good for all that it clearly conveys to one of ordinary skill. Bouevitch, et al clearly convey an operative embodiment, and in order to operate, the signals must be polarized in the manner recited.

With regard to claims 9, *et seq.,* it is clear from the discussion in Column 8 (lines 43 – 55) that the diffraction grating (120) is a "reflective type diffraction grating", as recited. The optical unit (150) may be regarded as comprising an active optical element (130) coupled to the grating (120) and being configurable to selectively convert said polarization components of said selected optical signal from said first polarization state

to a second polarization state; and an intermediate optical unit (152)(153) positioned between said diffracting grating (120) and said active optical element (130), and being configured to laterally displace and rotate said polarization components of said selected optical signal in an outgoing direction from said second polarization state to said first polarization state such that said polarization components of said selected optical signal are in said first polarization state at said diffraction grating in both said incoming and outgoing directions.

With regard to claims 6 – 8 and 14 - 16 the optical unit (150) comprises a controllable switching array (130) including liquid crystal pixels (Col. 6, lines 45 – 55) with a changeable optical property. At least in an embodiment where the above arrangement operates a differential gain equalizer (Col. 6, lines 34 – 44), it should be clear that the pixels include an electrically controllable birefringent material.

With regard to claims 17, *et seq.,* operation of the system of Bouevitch, et al fairly anticipates the recited method steps, including the step of transmitting the polarization components of the selected optical signal though a polarizing beamsplitter (152), as shown in the illustration during the reverse pass.

With particular regard to claim 18, the converting includes reflecting said polarization components of the optical signals at reflector (142).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 2 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bouevitch, et al, in view of Kewitsch, et al (U.S. Patent number 6,801,310). [The grounds of rejection stand as set forth in the last Office action and are repeated here only for convenience.] As set forth above for claims 1 and 9, Bouevitch, et al disclose the invention substantially as claimed. However, Bouevitch, et al do not disclose the grating line frequency as being greater than 900 lines per mm, as recited.

In the same field of endeavor, Kewitsch, et al disclose an apparatus for dispersing, weighting, and routing wavelength division multiplexed optical signals carried over an optical fiber. Kewitsch, et al teach that a suitable grating line frequency for dispersing wavelengths used at fiber communications wavelengths should be 1100 – 1200 lines/mm. One of ordinary skill would have understood this as a teaching of a range of grating line frequencies that provides sufficient angular separation of the wavelengths and sufficient spectral resolution.

Barring any unexpectedly improved result arising from the particular selection of grating line frequencies, it would have been obvious to one of ordinary skill to provide the grating of Bouevitch, et al with a grating line frequency greater than 900 lines per mm, since Kewitsch, et al, suggest line frequencies in excess of this as being useful for fiber communications wavelengths.

Allowable Subject Matter

Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art, taken alone or in combination, fails to teach or to fairly suggest *the combination* particularly wherein the intermediate unit comprising a Wollaston prism and a waveplate arranged as recited in claim 12.

Although Wollaston prisms are well-known polarization beam splitters, due to the angular separation of the split beams, one of ordinary skill would *not* have found it obvious to substitute a Wollaston beam splitter for the beam splitter of Bouevitch, et al. The apparatus simply would not have operated as intended.

Response to Amendment

Applicants' remarks concerning the patentability of claim 1 over the disclosure of Bouevitch, et al (U.S. Patent number 6,498,872) have been fully considered, but are not found persuasive. Applicants argue that a walk-off crystal such as birefringent crystal (152) of Bouevitch, et al is not a "polarizing beamsplitter", and argue that the expression "polarizing beamsplitter" refers only to elements that selectively reflect components of a certain polarization state. The examiner notes that this latter operation of a "polarizing beamsplitter" is described in the instant specification, at paragraph [0046]. However, while terms and expressions used in the claims are read in light of the specification, the

term "polarizing beamsplitter" has common meaning in the art. A birefringent plate that divides a light beam containing orthogonal polarization components into two separately directed light beams of orthogonal polarization (as does the plate 152 of Bouevitch, et al), fairly constitutes a "polarizing beamsplitter" in the broadest reasonable sense. Such use of the expression "polarizing beamsplitter" is ubiquitous in the art (see for example, the references cited below). Applicant has not set forth an explicit definition for this term with such "clarity, deliberateness, and precision" so as to apprise those of ordinary skill of any departure from the ordinary meaning. Thus, the term has been given its broadest reasonable meaning as would be ascribed by a person of experience in the field of the invention. *Desiccants Inc. v. Medzam Ltd.,* 133 F.3d 1473, 1477, 45 USPQ2d 1429, 1432 (Fed. Cir. 1998). *In re Paulsen,* 30 F.3d 1475, 1480, 31 USPQ2d 1671, 1674 (Fed. Cir. 1994) at 1674. Thus, the Bouevitch, et al disclosure is not deficient in the manner relied upon by Applicants, and the rejection of claims 1, 3, and 6 – 8 under 35 U.S.C. §102(e) as being anticipated by Bouevitch, et al stands as set forth above.

Similarly, since the Bouevitch, et al disclosure is not deficient with respect to the base claim, the rejection of claim 2 under §103(a) as being unpatentable over Bouevitch, et al in view of Kewitsch, et al (U.S. Patent number 6,801,310) stands as set forth above.

Applicant's amendment of claim 9 is not sufficient to distinguish over Bouevitch, et al, since Bouevitch, et al *do* in fact disclose the diffraction grating (120) as being a "reflective type", since one of ordinary skill would understand that a diffraction grating

that reflects the incident beam as described in Column 8, lines 43 – 55 to be a "reflective type grating", as recited. The earlier discussion (Col. 8, lines 15+) of the dispersed light beam as being "transmitted" refers to operation of the lens ("transmitted as 8 sub-beams . . . through lens 110b"). Accordingly, the disclosure of Bouevitch, et al is not deficient in the manner relied upon by Applicants, and the rejection of claims 9, 11, and 13 – 16 under §102(e) as being anticipated by Bouevitch, et al stands as set forth above.

Similarly, since the Bouevitch, et al disclosure is not deficient with respect to the base claim, the rejection of claim 10 under §103(a) as being unpatentable over Bouevitch, et al in view of Kewitsch, et al stands as set forth above.

Applicants' remarks concerning the patentability of claim 17 over the disclosure of Bouevitch, et al have been fully considered, but are not found persuasive. As set forth above with respect to claim 1, the birefringent plate (152) fairly constitutes a "polarizing beamsplitter" within the ordinary meaning. The operation of the beamsplitter to "laterally displace" (as distinguished from angularly displacing) the polarization components is evident by inspection. Although displacement in the figure is vertical, it will be appreciated that the apparatus is disposed arbitrarily in space. In any event, the beams exit the beamsplitter in a manner to be displaced to one side of each other, or laterally. Since, the feature newly recited in the base claim *is* in fact disclosed by the reference, the rejection of claims 17 – 20 under §102(e) as being anticipated by Bouevitch, et al stands as set forth above.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

MacArthur (U.S. Patent number 5,251,058) discloses a birefringent plate arranged to divide the paths of orthogonally polarized light from that of a single beam, and term the plate a " polarizing beam splitter" (21).

Patel (U.S. Patent number 5,111,321) discloses a birefringent plate (52) arranged to divide the paths of orthogonally polarized light from that of a single beam, and terms the plate a " polarization beam splitter" (see discussion of Fig. 4).

Ferguson (U.S. Patent number 4,408,329) discloses a birefringent plate (23) arranged to divide the paths of orthogonally polarized light from that of a single beam, and terms the plate a "beamsplitter".

Shiraishi, et al (U.S. Patent number 5,267,078) disclose a birefringent plate (5) arranged to divide the paths of orthogonally polarized light from that of a single beam, and term the plate a "polarizing beam splitter" (Col. 2, lines 40 – 45). Shiraishi, et al further teach the equivalence of such beamsplitters with the arrangement of a polarizing beamsplitting cube and mirror (*vis-à-vis* the 5th 7 6th embodiments, see *esp.* Col. 6, lines 40 – 45).

Cohen, et al (U.S. Patent Appl. Pub. no. 2005/0036202 A1) disclose an optical device comprising a diffraction grating, selective polarization rotator, and polarization diversity optics at the input.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Juba whose telephone number is (571) 272-2314. The examiner can normally be reached on Mon.-Fri. 9 - 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Drew Dunn whose number is (571) 272-2312 and who can be reached on Mon.- Thu., 9 – 5.

The **new centralized fax phone number** for the organization where this application or proceeding is assigned is (571) 273-8300 for *all* communications.

JOHN JUBA, JR.
PRIMARY EXAMINER
Art Unit 2872

August 8, 2005